History and mystery

Retroactive prayer: a preposterous hypothesis?

Brian Olshansky, Larry Dossey

Our Christmas 2001 issue included a study showing that retroactive prayer can improve health outcomes. But how are we to reconcile this result with our present understanding of the universe? Perhaps the answer lies beyond the superstring theories of today's physicists

"We are not—even though we might prefer to be—the slaves of chronological time."

J B Priestley, *Man and Time*, 1978[w1]

"If the existence of the present and future depends on the past, then the present and future should be in the past."

Nagarjuna (c150-c250), *Fundamental Wisdom of the Middle Way*[w2] c150-c250

Studies involving intercessory prayer challenge the belief that thoughts and intentions cannot act remotely.[1–4] Equally challenging is the possibility that human intentions and perceptions act outside the present.[5–7 w3] What if prayer actually influences the person to whom it is directed, no matter how far removed? What if prayer affects the past?

A study of retroactive prayer

Leibovici published an intriguing study questioning conventional notions of time, space, prayer, consciousness, and causality.[8] The randomised, controlled, double blind, parallel group study (prayer versus no prayer) included 3393 septic patients and considered the hypothesis that "retroactive" prayer, offered 4-10 years later, affects outcomes. Of the preselected outcomes, mortality was similar in both groups, yet length of stay in hospital and duration of fever were shorter with prayer ($P=0.01$ and $P=0.04$). Leibovici, with humour befitting his style, concluded that remote, retroactive intercessory prayer should be considered for clinical practice.

Plausibility

Leibovici cautioned that a deep model of the physical world is essential for choosing hypotheses; practices that do not fit the model should not be tested in humans.[9] "Would you believe a study that looks methodologically correct but tests something that is completely out of people's frame (or model) of the physical world?" he asked elsewhere.[10]

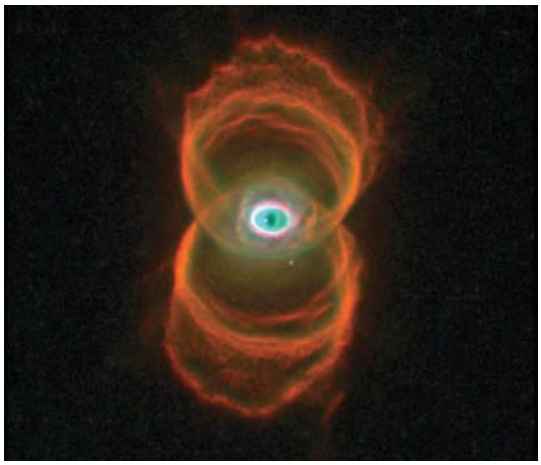
Should a study violating common sense or an accepted model be summarily dismissed? Not necessarily. Consider views that have been held to be utterly implausible—vitamins prevent disease, microbes cause disease, and atherosclerosis causes myocardial infarction (in 1911 Herrick was almost laughed out of medicine for stating this).

Strongly held convictions are often wrong: "The earth is flat"; "Heavier than air flying machines are impossible" (Lord Kelvin, president, Royal Society, 1895); "The telephone has too many shortcomings to be seriously considered" (Western Union internal memo, 1876); "Everything that can be invented has been invented" (Charles H Duell, commissioner, US Office of Patents, 1899). Of course, all hypotheses, plausible or not, must be held to scientific proof. Does it necessarily follow that prayer cannot function remotely in space and time?

Time and consciousness

We are nowhere near understanding laws pertaining to Leibovici's experiment, including those governing space, time, intention, and consciousness. Physicists have profound doubts about how time operates.[w4] Consciousness is equally puzzling.[11 w5] Dismissing retroactive prayer, which involves both, seems premature.

Any definitions for time and consciousness are admittedly inadequate, incomplete, and tentative. Consciousness—"the totality of one's thoughts, feelings, and impressions,"[12] including volition and will, that surface in the act of prayer and time, "the entire



Looking into the starry sky, the distant past is evident to our naked eye. The starlight streaming from heavenly bodies—like the Etched Hourglass Nebula—tells us not what the stars are like now, but millions of years ago[25]

University of Iowa Hospitals, Iowa City, IA, USA

Brian Olshansky
director of cardiac electrophysiology

Alternative Therapies in Health and Medicine, Santa Fe, NM, USA

Larry Dossey
executive editor

Correspondence to:
B Olshansky
brian-olshansky@uiowa.edu

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References w1-w24 are on bmj.com

period of existence of the known universe,"[12] are accepted. But the distant past is the present; heavenly bodies that existed millions of years ago still appear to exist now.

Controlled clinical trials, reviews, and meta-analyses of distant healing and prayer[w6] report positive findings.[13–14 w7-w11] Studies of non-humans suggest that the influence of prayer cannot be explained psychologically or ascribed to placebo.[w6] These data cannot be easily dismissed. Consciousness may influence and mirror the physical world in obscure ways, with prayer a manifestation of consciousness acting outside oneself.

Even the best models of reality are incomplete or incorrect. Stephen Hawking stated, "We have no idea how the world really is. All we do is build up models which seem to prove our theories."[15] It is human nature to defend the familiar and to reject the foreign, even within science. A peer reviewer rejected a paper on remote actions of consciousness, exclaiming, "This is the kind of thing I would not believe even if it existed."[16]

Leibovici dismisses his findings to uphold a view of how things should work: "If the pretrial probability is infinitesimally low, the results of the trial will not really change it, and the trial should not be performed. This, to my mind, turns [my] article into a non-study, although the details provided in the publication . . . are correct."[8] Leibovici's auto-rejection brings a dangerous level of arbitrariness to the scientific process. Why disqualify one study and not another, when both had acceptable methods?

Reductio ad absurdum

Leibovici disproves a proposition by showing the consequences to be impossible or absurd. Using quantum theory, Einstein showed that the position and momentum of distant particles are correlated, regardless of separation.[w12 w13] This violated accepted notions and required rejection of the theory of relativity. Einstein insisted that this was unthinkable and, therefore, that quantum theory is flawed—reductio ad absurdum. Bell's theorem[w14] and several supporting experiments confirmed quantum theory.[17 w15 w16]

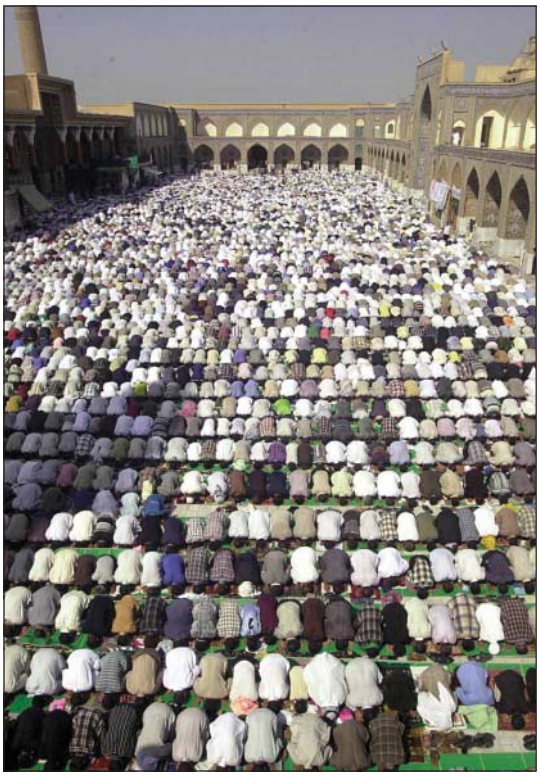
Einstein's position was undermined; reductio ad absurdum was turned on its head. In one of the most profound discoveries in science, a new class of phenomena was recognised: "non-local events," in which distant happenings are eerily linked without crossing space, without decay, and without delay.[w17]

Parallels exist between Einstein's experiment and Leibovici's study. In both, empirical evidence suggests that a possibility that was initially considered implausible may in fact be true. Just as Einstein's experiment paved the way for non-locality, Leibovici may have laid bare a facet of reality—unity and inseparability of all humans across space and time. Retroactive prayer may be less absurd than he supposes, in the light of the discovery of non-local phenomena.

Methodological problems

Plausibility aside, Leibovici's study contains shortcomings. The exact nature, sincerity, and duration of the prayer are obscure. The extent that extraneous prayer (prayer by the subjects and their loved ones) may have penetrated the intervention and control groups is unknown. Leibovici's study may be the only experiment about human prayer published in which a single individual was enlisted to pray. What was this individual like? Was the praying person an experienced healer or was prayer perceived as a casual venture? Leibovici does not define prayer or specify its type. Was the prayer religious and, if so, of which religion? Most religions are theistic. Was prayer in Leibovici's study to a deity or to the universe at large? Did the praying individual request a specific outcome, or was prayer open ended; a "thy will be done" type strategy? How these factors affect outcomes is unknown, but they should be acknowledged and tackled.

The possibility that intentions and wishes of an intercessor might influence the outcome of an experiment about prayer raises the possibility that intentions of the experimenter might do the same. Could such intentions affect clinical outcomes? Was "randomisation" random, or could Leibovici's intentions have interfered? These questions are not frivolous. Attempts to mentally influence generators of random numbers suggest that individuals can interfere with natural processes, which are believed to be inherently random. One meta-analysis, containing 832 studies and 68 investigators, found that people could indeed influence random processes. The odds against chance in this meta-analysis was more than a trillion to one.[18] Do experimental data with generators of random numbers apply to clinical experiments? This issue is far from settled, but raises concerns about validity of randomisation in all clinical trials, not just those involving prayer.[w18]



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"Everyone prays in their own language, and there is no language that God does not understand. "—Duke Ellington[27]

Retroactive intentions: supporting evidence

Three dimensions, even 10, cannot describe reality. Bosonic string quantum mechanics is consistent in 26 dimensional space-time, yet even this model is incomplete, as it does not include consciousness or intentionality. How and where do they fit?[19 w19 w20]

Models of space and time permitting bidirectional interactions between present and past exist. A current image of the topology of the space-time continuum includes wormholes that link remote regions, when space-time is pinched or folded. Some physicists hypothesise that Calabi-Yau space might allow bidirectional interactions between past and future.[w21] These possibilities cannot be dismissed.

William Braud, director of research at the Institute of Transpersonal Psychology in Palo Alto, California, and codirector of the Institute's William James Center for Consciousness Studies, summarised 19 studies of 233 sessions, in which individuals attempted to influence, retroactively, various living systems. Ten studies had significant results.[5]

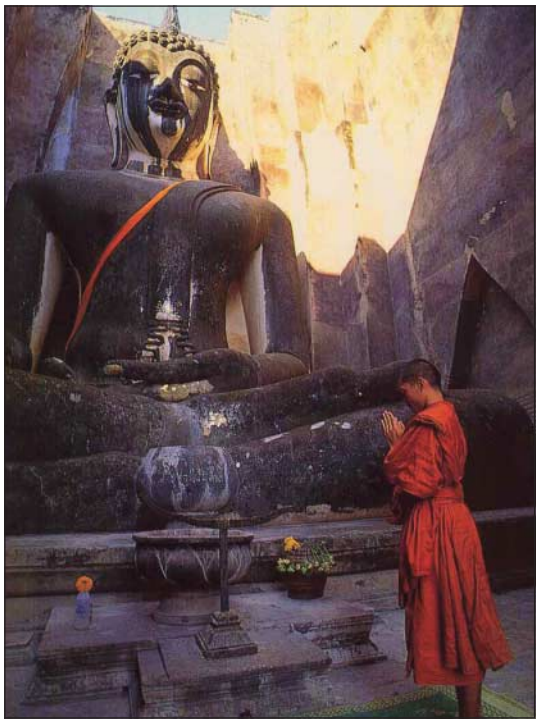
Schmidt did foundational work about retroactive intentions with electronic generators of random numbers and with inherently random processes such as radioactive decay.[6] Human intent influenced prerecorded events at the quantum level in the present if the recording of the quantum events had not yet been seen, even though the events were in the past and had happened.[w22] Schmidt's experiments, widely regarded among the most precise ever in human intentionality, evoke praise, even from sceptics.[w23]

These data indirectly support retroactive prayer, but the mechanism of influence is unknown. In particular, studies of prayer give no insight on theological questions, including whether God exists, whether divine intervention occurs, and whether such intervention is fair or just. Experiments about prayer cannot differentiate whether an effect is due to mental intentions acting directly on the distant individual or whether the effects are mediated divinely. These questions may remain transempirical and philosophical, yet they should not be used to reject results of research into prayer.[20]

Thinking outside the box

Prayer and distant healing await a Newton who might explain how they happen, or perhaps not. When asked the mechanism underlying his proposal of universal gravity, Newton wisely declared, "Hypotheses non fingo [I frame no hypotheses]." Surely, this approach is justified in clinical medicine; we often know that something works before knowing how.

Visionary thinkers require elbowroom and latitude to take chances, including freedom to err. This freedom should include permission to speculate about remote operations of consciousness. This stance is hardly novel; Nobel physicist Erwin Schrödinger suggested that at some level all minds are connected and are just one.[21] Physicist David Bohm concurred: "If we don't establish these absolute boundaries between minds, then . . . it's possible they could . . . unite as one mind."[22] Quantum theorist Henry Stapp suggested that human thoughts are linked to nature remotely by nonlocal connections.[23] If these speculations are true, they might increase our understanding of how prayers and intentions may act remotely.



"Prayer does not use any artificial energy, it doesn't burn up any fossil fuel, it doesn't pollute."—Margaret Mead[26]

The next steps

Novel phenomena continually challenge our view of reality and confuse the logical constructs that we develop. These phenomena will remain puzzling until a new model emerges. By chance alone, one study of retroactive prayer may be significant. Other well designed studies may confirm or refute this. The level of evidence needs to be robust, but this is not the only driver. Experience, ritual, training, and common sense shape clinical practice in conjunction with applicable scientific data. Even within science, tenets held as truth are not always validated objectively. Scientific evidence is not necessarily proof that something is wholly true. Consider how the Hubble Telescope shook the concept of expansion of the universe.[24] And consider reversal in thinking about hormone replacement therapy in postmenopausal women.[w24]

The next pioneer, the next piece of evidence, and the next well designed trial may provide better understanding. Until then, we pray, encourage positive prayer, and support prayer's timeless nature.

Conclusion

Questions raised by intercessory prayer and distant healing are far reaching, challenging basic assumptions about the nature of consciousness, space, time, and causality. Many consider these issues vexing and simply ignore them. But, if distant effects of consciousness are real, they will not cease to exist; these effects will operate in the background of our lives and, quite possibly, in our experiments. Others dismiss these events as trivial or irrelevant to the mission of healthcare professionals.

Summary points

Human conscious intention, including that delivered by prayer, may act remotely to evoke a healing response

The seemingly preposterous observation that prayer may influence past events as well as the present is particularly challenging

If conscious intent can act retroactively, to affect past events, this will have profound implications for our understanding of prayer, consciousness, healing, and ourselves

Conversely, non-local expressions of consciousness may be crucial in relieving human pain, medical science will be enriched by coming to terms with these phenomena, and an understanding of our place in the world will be increased in the process. We could achieve these advances by applying rigorous standards of empirical research that have consistently guided medicine through treacherous waters, including assessment of seemingly counterintuitive assertions. This is science doing its job.

Rather than dismissing studies of prayer because they do not make sense or confirm our existing knowledge, we should consider them seriously exactly for this reason. In the history of science, findings that do not fit in often yield the most profound breakthroughs.

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Contributors and sources: LD has long had an interest in the role of prayer and consciousness in healing, explored these issues in a series of books, and lectured on these subjects worldwide. BO encourages patient centered, empowered, beneficent, optimistic, compassionate, and charitable medical care; considers human connection vital to health and has strong interest in the power of prayer; and has a background in scholarly investigation and serves as member of the National Center of Complementary and Alternative Medicine Review Panel for the National Institutes for Health, reviewing research on prayer, spirituality, and consciousness. The sources for this article were Leibovici's work (and reader's comments) in the *BMJ*, an extensive literature search, years of study, personal experience, and our own consciousness.

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1 Sicher F, Targ E, Moore D, Smith HS. A randomized double-blind study of the effect of distant healing in a population with advanced AIDS: report of a small-scale study. *West J Med* 1998;169:356-63.
2 Harris W, Gowda M, Kolb JW, Strychacz CP, Vacek JL, Jones PG, et al. A randomized, controlled trial of the effects of remote, intercessory prayer on outcomes in patients admitted to the coronary care unit. *Arch Int Med* 1999;159:2273-8.
3 Byrd R. Positive therapeutic effects of intercessory prayer in a coronary care unit population. *South Med J* 1988;81:826-9.
4 Krucoff MW, Crater SW, Green CL, Maas AC, Seskevich JE, Lane JD, et al. Integrative noetic therapies as adjuncts to percutaneous intervention during unstable coronary syndromes: Monitoring and Actualization of Noetic Training (MANTRA) feasibility pilot. *Am Heart J* 2001;142:760-7.
5 Braud W. Wellness implications of retroactive intentional influence: exploring an outrageous hypothesis. *Altern Ther Health Med* 2000;6:37-48.
6 Schmidt H. Collapse of the state vector and psychokinetic effect. *Found Phys* 1982;12:565-81.
7 Bierman DJ, Radin DI. Anomalous anticipatory response on randomized future conditions. *Percept Mot Skills* 1997;84:689-90.
8 Leibovici L. Beyond science? Effects of remote, retroactive intercessory prayer on outcomes in patients with bloodstream infection: randomized controlled trial. *BMJ* 2001;323:1450-1.
9 Leibovici L. Alternative (complementary) medicine: a cuckoo in the nest of empiricist reed warblers. *BMJ* 1999;319:1629-32.
10 Leibovici L. Doctors and complementary medicine: author's reply. *BMJ* 2000;320:1145.
11 Searle J. [Quotation on front cover.] *J Consciousness Stud* 1995;2.
12 Guralnik DB, ed. *Webster's new world dictionary*. 2nd college ed. New York: Prentice Hall, 1986:302, 1489.
13 Astin JE, Harkness E, Ernst E. The efficacy of "distant healing": a systematic review of randomized trials. *Ann Int Med* 2000;132:903-10.
14 Jonas WB, Crawford CC. Science and spiritual healing: a critical review of spiritual healing, "energy" medicine, and intentionality. *Altern Ther Health Med* 2003;9:56-61.
15 Boslough J. *Stephen Hawking*. New York: Universe Avon, 1985.
16 Targ R, Puthoff H. *Mind-reach: scientists look at psychic ability*. New York: Delta, 1977:169.
17 Aspect A, Dalibard J, Roger G. Experimental test of Bell's inequalities using time-varying analyzers. *Phys Rev Lett* 1982;49:1804.
18 Radin DI, Nelson RD. Evidence for consciousness-related anomalies in random physical systems. *Found Phys* 1989;19:1499-514.
19 Schwarz P. Space, time, and string theory. www.superstringtheory.com/blackh/blackh4a.html (accessed 27 Nov 2003).
20 Chibnall JT, Jeral JM, Cerullo MA. Experiments in distant intercessory prayer: God, science, and the lesson of Massah. *Arch Int Med* 2001;161:2529-36.
21 Dossey L. The immortal, one mind: Schrödinger, Gödel, Einstein. In: *Recovering the soul*. New York: Bantam, 1989:123-52.
22 Weber R. *Dialogues with scientists and sages*. New York: Routledge and Kegan Paul, 1986:41.
23 Stapp H. Harnessing science and religion: Implications of the new scientific conception of human beings. *Res News Opportunities Sci Theology* 2001;1:8.
24 Freedman WL. The Hubble constant and the expanding universe. *Am Sci* 2003;91:36-43.
25 http://antwrp.gsfc.nasa.gov/apod/ap960118.htm (accessed 9 Dec 2003).
26 Mead M. Sunbeams. *Sun* 1994;228:40.
27 Tucker MC, ed. *The Duke Ellington reader*. New York: Oxford University Press, 1994:371.

Pump it up

A 70 year old retired mining engineer was diagnosed as having ischaemic heart disease. His symptoms were noticeably worse in cold weather, limiting his activity tolerance. He started measuring the distance he could walk before he developed angina. He then correlated this with the outside temperature using a household thermometer. He discovered that when the outside temperature dropped below 6°C his exercise capacity was greatly reduced and he could manage only 50 metres on the flat before having to use glyceryl trinitrate. He was inspired to invent this simple device for relieving angina. It consists of a battery operated air pump (as used by keepers of tropical fish), some hollow plastic tubing, and an industrial dust mask and delivers warm air to his face. Using this device he can manage 800 metres.

Dinesh Selvarajah *clinical research fellow, Northern General Hospital, Sheffield*